Ordering number : EN 2843

Monolithic Linear IC



No.2843

LA7938

Electronic Channel Select System Control Circuit for TV / VCR Use

Overview

The Sanyo LA7938 Monolithic Linear TV/VCR Electronic Tuner System Controller IC integrates all the peripheral circuitry for a TV or VTR tuner, with the exception of the microcontroller, into a single chip.

It incorporates a 2-input/4-output band-switch, 5.0V and 5.75V voltage regulators, comparator, sync signal processing circuit, AFT DC shift circuit and constant current circuit. Each PNP output of the band-switch circuit typically sources 40mA, eliminating the need for external current drivers.

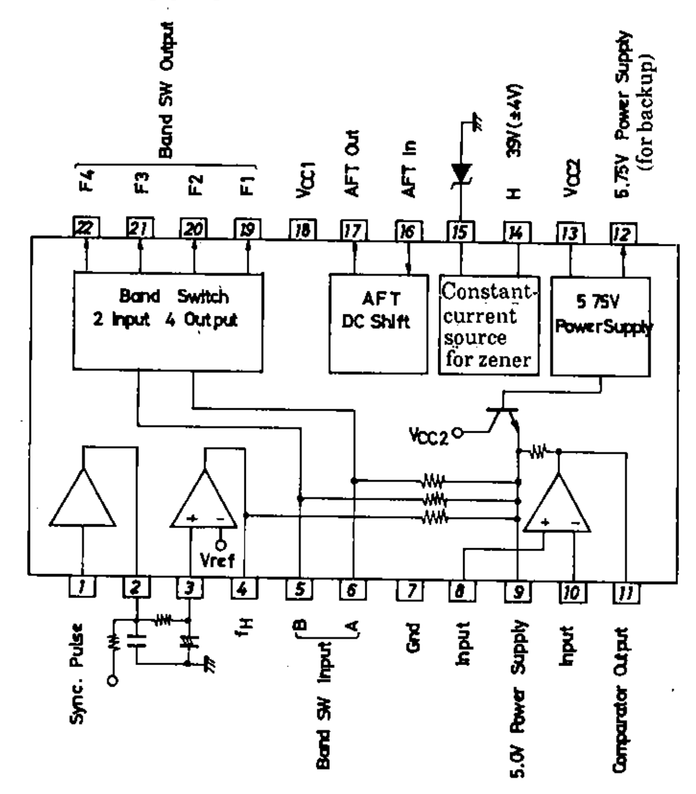
The LA7938 operates from a recommended supply voltage range of 8.7 to 12.5V. It is available in 22-pin shrink DIPs.

Features

- Integrates all tuner peripheral circuits except controller
- Band-switch outputs source up to 40mA
- Regulators each supply up to 50mA
- 22-pin shrink DIP

Block Diagram

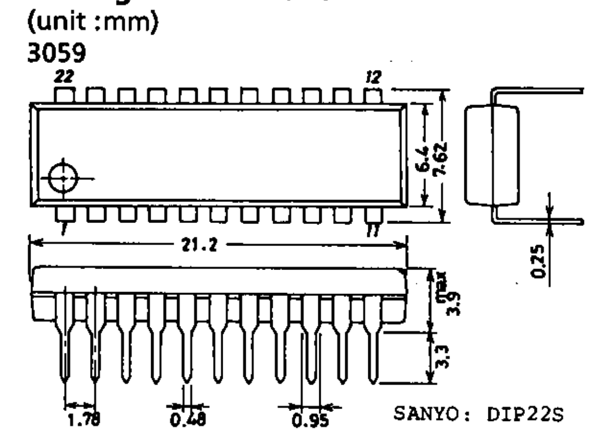
[For backup purposes]



Package Dimensions

(unit : mm)

3059



Maximum Ratings at Ta = 25°C				unit
Allowable Power Dissipation	Pd max	Ta ≦ 65°C	1000	mW
Operating Temperature	Topr		–20 to +65	°C
Storage Tempeature	Tstg		–55 to +150	°C
[Band-Switch]				
V_{CC1} Maximum Supply Voltage	V_{18} max		13	V
Maximum Load Current	I_{19} max		–50	mA
	I_{20} max		–50	mA
	I_{21} max		–50	mA
	I_{22} max		–50	mA
Applied Imput Voltage	V_6 max		3.5	V
	V_5 max		3.5	V
[Sync Detector]				
Positive Input Voltage	V_1 max		3.5	V
Negative Input Voltage	$-V_1$ max		–1.4	V
Applied Input Voltage (Pin3)	V_3 max	$V_{CC}1 = 13V$	10	V
Applied Input Voltage	V_4 max	$V_{CC}1 = V_{CC}2 = 12V$	4.6	V
[Voltage Regulators]				
V_{CC2} Supply Voltage	V_{13} max		13	V
+5.75V Output Current	I_{12} max		–50*	mA
+5.0V Output Current	I_9 max		–50*	mA
[Comparator]				
Maximum Input Voltage	V_8 max	$V_{CC}2 = 13V$	13	V
	V_{10} max	$V_{CC}2 = 13V$	13	V
Applied Output Voltage	V_{11} max		6	V
[+31V Constant Current Source]				
Applied Voltage	V_{14} max		43	V
[AFT Shift Circuit]				
Maximum Input Voltage	V_{16} max	$V_{CC}1 = 13V$	13	V

*: The rating for the total current drawn from both the 5.0V and 5.75V supplies is 70mA.

Operating Conditions at Ta = 25°C			unit
Operating Voltage Range	V_{CC} op	8.7 to 12.5	V

(Band-Switch Truth Table)

Input		Output			
A (Pin6)	B (Pin5)	F1 (Pin19)	F2 (Pin20)	F3 (Pin21)	F4 (Pin22)
L	L	H	Z	Z	Z
H	L	Z	H	Z	Z
L	H	Z	Z	H	Z
H	H	Z	Z	Z	H

Z: HIGH-impedance

Operating Characteristics at Ta = 25°C, $V_{CC}1$, $V_{CC}2$ = 12V			min	typ	max	unit
Quiescent Current Dissipation (1)	$I_{CC}1$			9.0		mA
Quiescent Current Dissipation (2)	$I_{CC}2$			7.0		mA
[Band-Switch]						
Output Saturation Voltage	F_1 (sat.)	$I_O = -40mA$			0.7	V
	F_2 (sat.)	$I_O = -40mA$			0.7	V
	F_3 (sat.)	$I_O = -40mA$			0.7	V
	F_4 (sat.)	$I_O = -40mA$			0.7	V
H-Level Input Voltage	V_{5HI} V_{6HI}	Open gate type microcomputer must be in OFF state (pull-up resistance on chip).				
L-Level Input Voltage	V_{5LO}				0.8	V
	V_{6LO}				0.8	V
Output Leakage Current	I_{FL}		−50			μA
[Sync Circuit]						
Input Threshold Voltage	V_{1TH}		0.4	0.72	1.5	V
Pin2 Output Saturation Voltage	$V_{2(sat.)}$	$I_{SINK} = 10mA$			1.0	V
Pin3 H-Level Input	V_{3HI}		5.0			V
Pin3 L-Level Input	V_{3HO}				3.0	V
Pin4 Output Saturation Voltage	$V_{4(sat.)}$	$I_{SINK} = 2mA$			0.7	V
[+5.75V, +5.0V Regulators]						
+5.75V Output Voltage	V_{12}	$I_{12} = -20mA$	5.35	5.75	6.15	V
+5.75 Output Voltage Regulation	V_{12Reg}	$I_{12} = 5mA \rightarrow 20mA$	−25		25	mV
+5.0V Output Voltage	V_9	$I_9 = -20mA$	4.6	5.0	5.4	V
+5.0V Output Voltage Regulation	V_{9Reg}	$I_9 = 5mA \rightarrow 20mA$		50	100	mV
[31V Current Source]						
Pin15 Output Current	I_{15}		4.2	6.0	7.8	mA
[AFT Shift Circuit]						
DC Shift Voltage	$V_{16} - V_{17}$		4.23	4.73	5.23	V
Pin17 Maximum Output Voltage	V_{17} max		5.35	5.75	6.15	V
[Comparator]						
Maximum Operating Input Voltage	$V_{8\ to\ 10}$ max		9.0			V
Minimum Operating Input Voltage	$V_{8\ to\ 10}$ min				0.7	V
Output Saturation Voltage	V_{11} (sat.)	$I_{SINK} = 2mA$			0.7	V